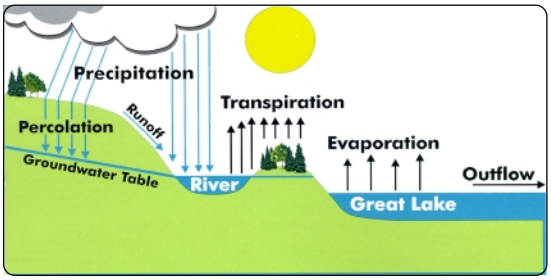
Water Levels of the Great Lakes

If you wander down the shores of Lake Michigan nowadays, it's difficult not to notice that beaches seem curiously wide. Rocks that were once barely visible now jut from the waves. Marina docks seem built too high for the boats that pull up to them. A glance at the pilings tells why: the dark line marking the lake level of previous years is three feet above the water. Between 1998 and 2000, the level of Lakes Michigan and Huron dropped at the fastest pace ever recorded. Lakes Superior and Michigan-Huron are at their lowest levels since 1926 and 1965, respectively. Lake Erie is the lowest since 1967. Long-time residents have been reminded of the droughts of the 1930s and 1960s when water levels also fell dramatically. Many more have grown concerned about the impact upon recreational boating, the shipping industry, and the environment.

Why do Lake Levels Fluctuate?

Great Lakes water levels respond to changes in their water supplies, including the precipitation falling on the lake, the runoff from their land basins in rivers and streams, and evaporation from the lake surfaces. The primary driving factors are precipitation and air temperatures. Lower precipitation leads to lower runoff as does higher air temperatures. Higher air temperatures also result in higher evaporation. The ice cover on the Great Lakes also decreases the evaporation during the winter.



Source: *Living with the Lakes*, U.S. Army Corps of Engineers; Great Lakes Commission, 1999.

The Hydrologic Cycle

Why are Water Levels Low Now?

Since the fall of 1997, we have had decreased precipitation over the Great Lakes basin, particularly in the upper lakes and have experienced significantly above-average air temperatures. This has resulted in lower-than-normal water supplies. In addition during the past four winters, the ice cover has been much below-average, also significantly contributing to the decreasing water levels.

Who is Affected by Lower Lake Levels?

The present low lake levels affect many interests, including commercial navigation, recreational boating, marinas, beaches, fishing, cottage and homeowners, water quality, and the aquatic ecosystem. For example last year the Lake Carriers that transport iron ore, coal, grain and other raw cargoes were forced into

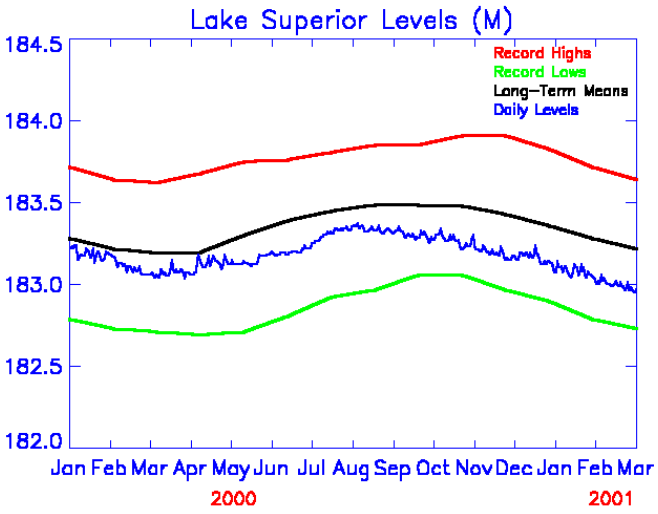
Photo by Greg Lang.

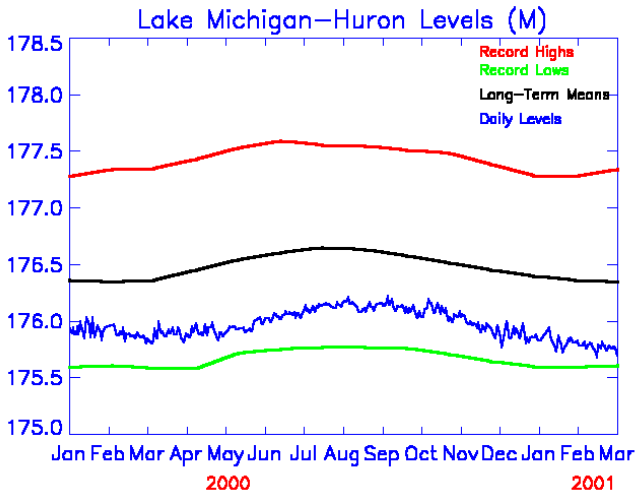
Low lake levels at Old Mission Point lighthouse in Lake Michigan.

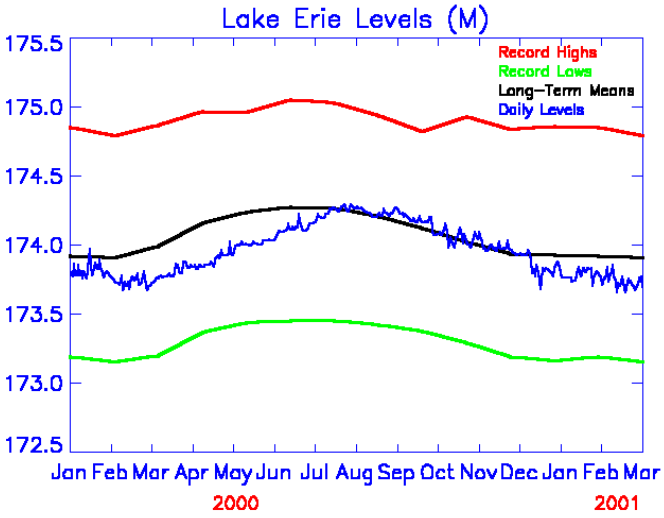
"light-loading," carrying 5 percent to 8 percent less goods, sending prices higher. Additionally, marinas spent millions to dredge boat slips, channels, and harbors along Great Lakes coasts.

What are the Current Conditions?

The following three graphs show the daily water levels for 2000 and for 2001 through February compared with the record highs and lows and the long-term mean.

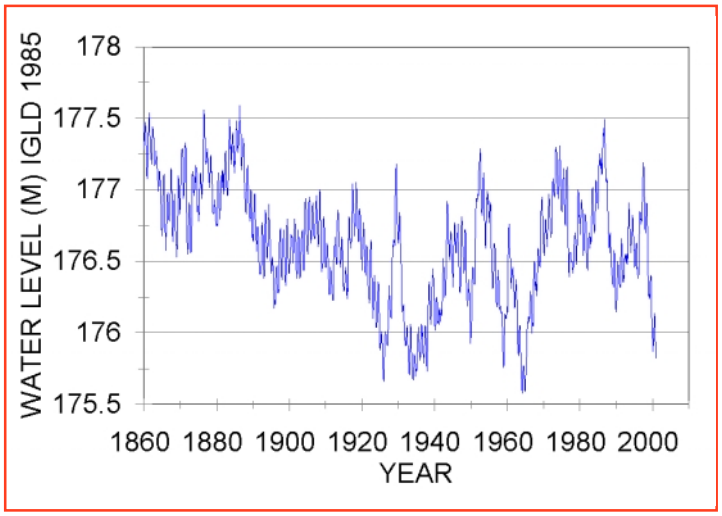






How do these lows compare with past lows?

Despite the low water levels we are currently experiencing, they are not the lowest levels on record. In the early 20th Century the levels of Lakes Michigan and Huron were lower than they are at present, and in 1964 -- their record low -- they were about 7 inches below their present level. The other lakes have been lower in previous years as well. In 1926, Lake Superior was 7 inches below its present level. In 1934 Lake Erie dipped 29 inches lower, and in 1935 Lake Ontario dipped 27 inches lower.



Lake Michigan-Huron water levels, 1860-2000.

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What is the outlook for 2001?

GLERL has the ability to make water supply and lake level forecasts 1-12 months into the future based on current basin hydrology and NOAA's long-term climate outlooks. As shown below, we expect low lake level conditions to continue this year with peaks from 2 to 8 inches lower than last year.